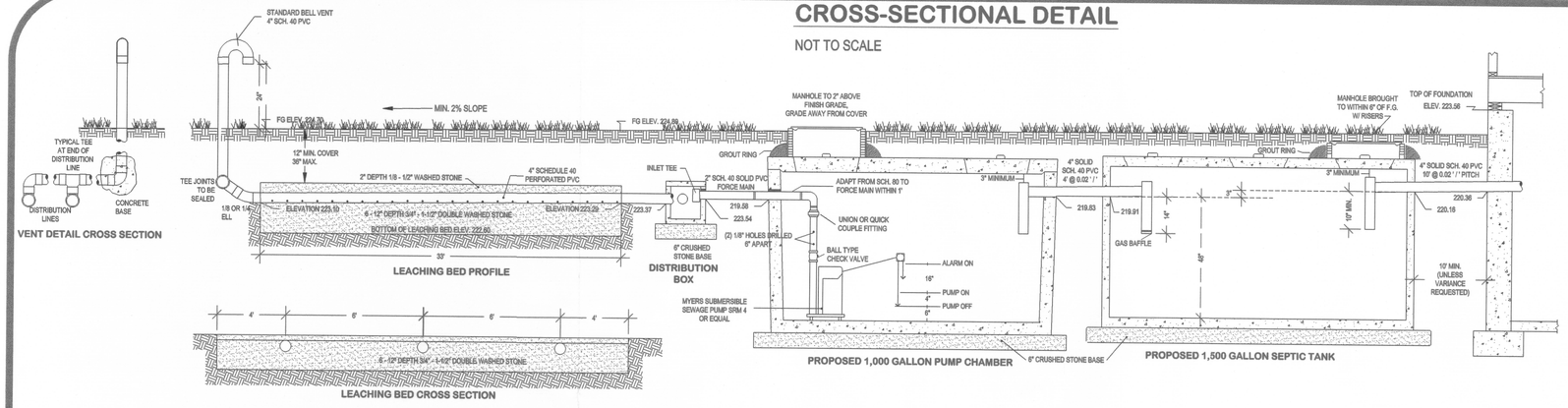
# CROSS-SECTIONAL DETAIL

NOT TO SCALE




## PROPOSED INLINE ELEVATIONS

| | |
|---|---|
| TOP OF FOUNDATION | 223.56 |
| INVERT AT HOUSE | 220.36 |
| SEPTIC TANK INLET INVERT | 220.16 |
| SEPTIC TANK OUTLET INVERT | 219.91 |
| PUMP CHAMBER INLET INVERT | 219.83 |
| PUMP CHAMBER OUTLET INVERT | 219.58 |
| D-BOX INLET INVERT | 223.54 |
| D-BOX OUTLET INVERT | 223.37 |
| PROPOSED ELEV. OVER SAS | 224.80 |
| LEACHING LINE ORIGIN INVERT | 223.29 |
| LEACHING LINE TERMINUS INVERT | 223.10 |
| BOTTOM OF SAS | 222.60 |
| DEEP HOLE TEST PIT SURFACE ELEV. | 222.29 |
| EST. SEASONAL HIGH GROUNDWATER | 217.29 |

## General Notes

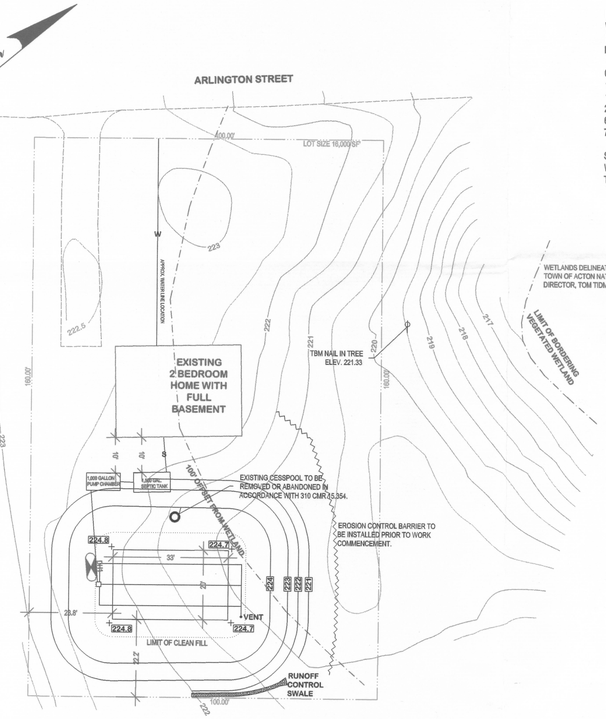
General Notes:

1. All utility locations shown are as marked by Digsafe and are to be verified by Contractor. Contractor shall call Digsafe, (800)322-4844, a minimum of 72 hours prior to commencing construction.
2. Inspections by Design Engineer and Board of Health are as required by the Board of Health.
3. This plan was prepared for the design of the subsurface sewage disposal system only and is based on the subsurface exploration and percolation tests listed.
4. System was designed only to accomodate sanitary sewage associated with normal domestic usage, consisting of water carried putrescible waste, and for flows indicated in the design criteria.
5. The system was not designed for garbage grinders and must be vented through the buildings plumbing in accordance with State Building Code.
6. Owner shall verify effective zoning regulations prior to construction.
7. Plans show only those features that were visually apparent on the date of topographic survey, and the absence of subsurface structures, utilities, etc. is not guaranteed.
8. Contractor to determine if site conditions are suitable for construction of proposed system, and must promptly notify the Design Engineer and Owner, in writing, of any plan deficiencies, unforeseen subsurface conditions, or required changes.
9. There are no wells located within 100 feet of the proposed leaching area or within 50 feet of the proposed septic tank.
10. System shall be periodically inspected and maintained as necessary. The septic tank should be pumped a minimum of once every two (2) years per Town of Acton regulation or when sludge depth exceeds 1/4 the liquid depth of the tank.

Technical Notes:

1. Building sewer shall be in accordance with state plumbing code and have a minimum of 4" of cover in landscaped areas. A minimum of 1' of cover or appropriate sleeving shall be used in areas subject to vehicular traffic.
2. All tanks, including septic tanks, distribution boxes, dosing chambers, and grease traps shall be either watertight through manufacturer's specification and warranty; or made watertight by the manufacturer or other individual by means and persons as approved in 310 CMR 15.221. accordanceSeptic tank shall be constructed and placed in accordance with 310 CMR 15.223 through 310 CMR 15.228. Septic Tanks shall have at least three (3) 20" man holes with at least one (1) of these manholes shall be located no more than 6" below finish grade. (Systems over 1,000 gpd shall have access ports at both the inlet and outlet tees.)
3. Distribution box ('d-box') shall be of water tight construction, installed level on a firm base. and designed and installed in accordance with 310 CMR 15.232.
4. D-box outlets shall be installed level for a minimum of the first 2' in order to equalize flow to the distribution lines.
5. The minimum inside dimension of the d-box shall be 12" with a minimum wall thickness of 2" for reinforced concrete units.
6. When the Soil Absorption System ('SAS') is to be dosed or the slope of the inlet pipe exceeds 0.08 feet per foot, an inlet tee, baffle or splash plate extending to one inch above the outlet invert elevation shall be provided to dissipate the velocity of the influent.
7. When the SAS is installed within the top and subsoil layers or above natural grade, all topsoil and subsoil shall be removed below and laterally for a minimum of 5 feet laterally the perimeter of the SAS. Removed material shall be replaced with clean granular material in accordance with 310 CMR 15.255(3).
8. All disturbed areas shall be loamed, seeded, and maintained so as to prevent erosion.
9. All SAS soil interfaces shall be scarified prior to placement of stone.

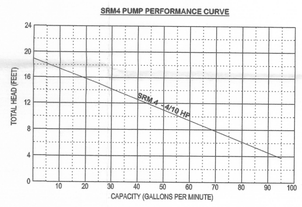
| No. | Revision/Issue | Date |
|---|---|---|
| 1 | remove ret. wall / vent | 3/17/98 |
| 2 | note changes, profile elevation | 5/6/98 |
| | | |







SWALE DETAIL (NOT TO SCALE)




## RESIDENTIAL PUMP CHAMBER NOTES:

1. Structures, pumps, and controls shall conform to the requirements of Title 5 and all applicable codes.
2. Pump Chamber shall be watertight with inlet and force main outlet located above estimated seasonal high groundwater.
3. The access manhole shall be of suitable size to allow pump removal (minimum 20" diameter), be child proof, and extend 2" above finish grade with grading away from the manhole cover.
4. The pump shall be capable of passing a 1-1/4" spherical solid, designed for pumping raw sewage under the conditions shown, and installed in accordance with manufacturers specifications.
5. Pump discharge shall be a minimum of 25 gpm against a TDH of 10 ft.
6. The motor shall have a minimum rating of 4/10 HP and shall be suitable for the available current, as determined by the Installer.
7. The chamber shall be sized to allow a total discharge dose of 330 gallons per dose and will store 330 gallons above the pump on float.
8. Controls shall be mercury switch floats installed to be visible from the manhole and set to operate as shown.
9. Pumps must be equipped with alarm and controls located inside the building served with separate power circuits for pump and alarm. Pump shall be switchable from automatic to manual operation. There shall be no splices or junction boxes installed within the pump chamber.
10. Manufacturers literature for pumps and related controls utilized shall be stapled next to controls.
11. Check valve shall be of ball type, installed vertically with two(2) 1/8" weep holes spaced 6" apart located on discharge side of check valve.
12. All pressure piping shall be secured and shielded from abrasion, and shall be coupled with high pressure PVC couplings.
13. Force main shall slope continually upward with a weep hole located above the check valve, or shall be protected from frost and freezing by sufficient cover or insulation.
14. The D-Box inlet shall be equipped with a solvent welded PVC inlet tee, extending to 1" above the outlet inverts to dissipate influent velocity.

## SOIL EVALUATION / DEEP HOLE TEST DATA

PERFORMED BY: DAVID SCHOFIELD
WITNESSED BY: ALAN PERRY
EXCAVATOR: ERNIE MERRILL
DATE(S): FEBRUARY 25, 1998

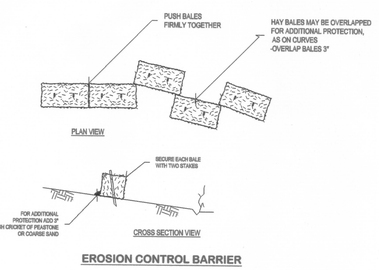
0-10" Ap, SANDY LOAM
10-18" Bw, SANDY LOAM
18- 24" C1, COARSE SAND, 7.5YR 5/8
24- 60" C2, COARSE SAND & COBBLES 2.5Y 5/6
60-78" C3, MEDIUM SAND, 2.5Y 6/5
78-96" C4, MEDIUM SAND & COBBLES, 10YR 4/6

STANDING WATER IN HOLE AT 78"
WEEPING(THEORETICAL) AT 60", ESHGW AT 60"
TEST HOLE DEPTH 96", NO REFUSAL ENCOUNTERED

| DEPTH | DH1 | ELEV. |
|---|---|---|
| 0" | | 222.29 |
| 10" | Ap, S.L. | 221.46 |
| 18" | Bw, S.L. | 220.79 |
| 24" | C1, C.S., 7.5YR 5/8 | 220.29 |
| | C2, COARSE SAND & COBBLES 2.5Y 5/6 | |
| ESHGW - 60" | | 217.29 |
| | C3, MEDIUM SAND 2.5Y 6/4 | |
| 78" | | 215.79 |
| | C4, M. S. & COBBLES 10YR 4/6 | |
| 96" | TEST HOLE DEPTH | 214.29 |
| | NO REFUSAL | |
| 120" | | 212.29 |

I certify than in September, 1996 I passed the examination approved by the Department of Environmental Protection and that the soil analysis shown on this plan has been performed by me consisten with the required training, expertise, and experience described in 310 CMR 15.018(2).

Signed:_____ Date:_____




EROSION CONTROL BARRIER

## BUOYANCY CALCULATIONS

*1,500 GALLON SEPTIC TANK*

DOWNWARD FORCE
= 12,000 # (tank) + [10.5 x 5.66 x (222.20 - 221.23)] x 110 #/cf = 12,000 # + 6,341 # = 18,341 #
UPWARD FORCE
= [216.80 - 215.57] x [10.5 x 5.66 x 62.4] = 4,561#
**18,341 > 4,561 # (CHECKS)**

*1,000 GALLON PUMP CHAMBER*

DOWNWARD FORCE
= 14,825 # (tank) + [8.5 x 4.83 x (222.4 - 221.00)] x 110 #/cf = 14,825 # + 6,322 # = 21,147 #
UPWARD FORCE
= [217.25 - 215.58] x [9.67 x 5.00 x 62.4] = 5,038 #
**21,147 > 5,038 # (CHECKS)**

## DOSING CALCULATIONS

*1,000 GALLON PUMP CHAMBER - 4* DOSES PER DAY
FORCE MAIN CONDUIT VOLUME = [(3.14 x (2/12)^2) / 4 ] x 7' / 7.48 = 0.02 gal
PROPOSED DOSE VOLUME = 8.57" x 3.90' x 0.33' x 7.48 gal / cf x 4 doses/day = 333.34 gal
**333.34 - 0.02 = 333.32 gals. =(approx.) 330 gals. (CHECKS)**

## TOTAL DYNAMIC HEAD CALCULATIONS

STATIC HEAD: 223.54 -219.60 = 3.94'
FITTINGS: 1' ALLOWED (TOTAL)
FORCE MAIN FRICTIONAL LOSSES: 1' ALLOWED
**TOTAL DYNAMIC HEAD = 5.94' (+/-)**

## ADDITIONAL NOTES

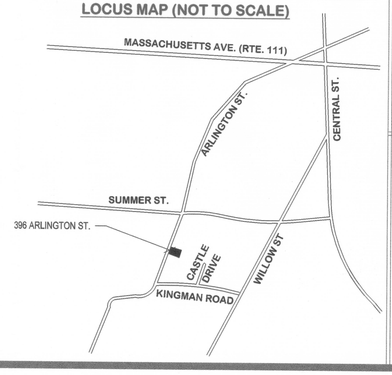
A) PROPERTY LINE INFORMATION GATHERED FROM SOUTHERN MIDDLESEX REGISTRY OF DEEDS IN PLAN 1855 OF1952, RECORD BOOK 7983, PAGE 444, AND FROM TOWN OF ACTON ASSESSORS MAPS.

B) EXISTING CESSPOOL TO BE ABANDONED OR REMOVED IN ACCORDANCE WITH 310 CMR 15.354 AND TOWN OF ACTON REGULATIONS. CESSPOOL SHALL BE PUMPED OF ITS CONTENTS, EXCAVATED, AND REMOVED FROM THE SITE. SOILS SURROUNDING CESSPOOL FOR 5' SHALL BE CONSIDERED IMPERVIOUS, EXCAVATED, AND DISPOSED OF PROPERLY.

C) BUILDING PLUMBING TO BE REWORKED SO AS TO CONNECT LAUNDRY FACILITIES TO BUILDING SEWER AS SHOWN IN PROPOSED DESIGN. EXISTING DRYWELL TO BE ABANDONED.

D) PROPERTY LOCATED IN TOWN OF ACTON AQUIFER ZONE 3. SPECIAL PERMIT FILED FOR WORK WITHIN THE AQUIFER ZONE.

## LOCUS MAP (NOT TO SCALE)




## DESIGN CRITERIA

1. FLOW: 3 BDRMS @ 110 GPD / BDRM = 330 GPD
2. SAS DESIGN CRITERIA:
   - A. DESIGN PERCOLATION RATE: 2 MIN / IN
   - B. EFFLUENT LOADING RATE: 0.50 GPD/SF
   - C. LEACHING AREA REQUIRED 660 SF
   - D. BOTTOM AREA PROVIDED: 660 SF
   - E. SIDEWALL PROVIDED: N/A
   - F. TOTAL AREA PROVIDED: 660 SF
   - G. DESIGN CAPACITY: 330 GPD

SYSTEM NOT DESIGNED FOR GARBAGE GRINDER

## PERC HOLE TEST DATA

PERC TESTING
PERFORMED BY: DAVID SCHOFIELD
WITNESSED BY: ALAN PERRY
DATE(S): FEBRUARY 25, 1998

ASSUMED PERC RATE OF 2 MIN./ IN.

## VARIANCES REQUESTED

*LOCAL VARIANCES*

REG. 11-15.1 - MINIMUM LEACHING AREA (900 SF REQUIRED, 660 SF PROPOSED).

REG. 11-15.9 - MIN. DEPTH OF STONE (12" REQUIRED, 6" PROPOSED)

## LEGEND

- EXISTING CONTOUR ——— 100 ———
- PROPOSED CONTOUR ——— (100) ———
- EDGE OF WETLAND
- EROSION CONTROL BARRIER
- CHAIN LINK FENCE
- EDGE OF PAVEMENT
- PROPERTY LINE
- PERC TEST PIT
- DEEP HOLE TEST PIT

Firm Name and Address

Residential Engineering Concepts
~~P.O. Box 752~~ P.O. Box 1343
~~Concord, MA 01742~~ Littleton, MA 01460
(888) 484-8535

Project Name and Address

Septic System Upgrade
Notargiacomo Family Trust - Dianne Humelsine
396 Arlington St.
Acton, MA

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MAY 08 1998
ACTON BOARD OF HEALTH

Stamp

COMMONWEALTH OF MASSACHUSETTS
DAVID A. SCHOFIELD NO. 1119
REGISTERED SANITARIAN
David A. Schofield 5/6/98

| Project | Sheet |
|---|---|
| 98-102 | 1 |
| Date: March 4, 1998 | |
| Scale: 1" = 20' | |

RECEIVED
MAY 8 1998
ACTON CONSERVATION COMMISSION

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